

ABSTRACT OF DISCLOSURE

A method for forming an isolation layer of a semiconductor device is disclosed. The method has a wet etching separately performed two times or more without a conventional chemical mechanical polishing process. In the method, a silicon substrate in which an active region and a field region are defined is provided, and a trench is formed in the silicon substrate within the field region. An insulating layer to be used as the isolation layer is then formed on the silicon substrate including the trench. Thus the trench is filled with the insulating layer. Next, a capping layer is formed on a resultant entire structure including the insulating layer, and selectively removed to expose an upper portion of the insulating layer in the active region. The exposed insulating layer in the active region is then removed by a first wet etching, and the residual capping layer is removed by a second wet etching. Accordingly, the isolation layer is obtained from the insulating layer remaining in the trench.